NTIS #

SSC-450

SHIP STRUCTURE COMMITTEE: EFFECTIVENESS STUDY

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SHIP STRUCTURE COMMITTEE

2007

CONVERSION FACTORS
(Approximate conversions to metric measures)

To convert from	to	Function	Value
LENGTH			
inches	meters	divide	39.3701
inches	millimeters	multiply by	25.4000
feet	meters	divide by	3.2808
VOLUME			
cubic feet	cubic meters	divide by	35.3149
cubic inches	cubic meters	divide by	61,024
SECTION MODULUS			
$inches^2$ $feet^2$	$centimeters^2$ $meters^2$	multiply by	1.9665
$inches^2$ $feet^2$	$centimeters^3$	multiply by	196.6448
$inches^4$	$centimeters^3$	multiply by	16.3871
MOMENT OF INERTIA			
$inches^2$ $feet^2$	$centimeters^2$ meters	divide by	1.6684
$inches^2$ $feet^2$	$centimeters^4$	multiply by	5993.73
$inches^4$	$centimeters^4$	multiply by	41.623
FORCE OR MASS			
long tons	tonne	multiply by	1.0160
long tons	kilograms	multiply by	1016.047
pounds	tonnes	divide by	2204.62
pounds	kilograms	divide by	2.2046
pounds	Newtons	multiply by	4.4482
PRESSURE OR STRESS			
$pounds/inch^2$	$Newtons/meter^2$ (Pascals)	multiply by	6894.757
kilo $pounds/inch^2$	mega $Newtons/meter^2$ (mega Pascals)	multiply by	6.8947
BENDING OR TORQUE			
foot tons	meter tons	divide by	3.2291
foot pounds	kilogram meters	divide by	7.23285
foot pounds	Newton meters	multiply by	1.35582
ENERGY			
foot pounds	Joules	multiply by	1.355826
STRESS INTENSITY			
kilo $pound/inch^2$ $inch^{½}$ ($ksi\sqrt{in}$)	mega Newton $MNm^{3/2}$	multiply by	1.0998
J-INTEGRAL			
kilo pound/inch	$Joules/mm^2$	multiply by	0.1753
kilo pound/inch	kilo $Joules/m^2$	multiply by	175.3

Technical Report Documentation Page

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16. Abstract
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SHIP STRUCTURE COMMITTEE: EFFECTIVENESS STUDY

Since its inception, the Ship Structure Committee (SSC) has worked diligently to sponsor and coordinate research and development projects that provide industry with useable tools to improve ship design, construction, operations, inspections, and maintenance and repair methodologies. The SSC recently took the occasion of its 60th anniversary to conduct an in-depth effectiveness study to determine if its sponsored research continues to meet the needs of the maritime community. A short survey was carefully developed and conducted through the SSC website. The survey results were analyzed and confirm that the SSC continues to provide resources that are valued and utilized by a worldwide audience.

In addition to the survey results and analysis, this report addresses the development of the survey questions and provides recommendations for future SSC effectiveness studies. Since 1946, the SSC has published over 445 reports that are currently available to the public on our website at http://www.shipstructure.org.

BRIAN M. SALERNO
Rear Admiral, U.S. Coast Guard
Chairman, Ship Structure Committee

SHIP STRUCTURE COMMITTEE LIAISON MEMBERS

LIAISON MEMBERS

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16. Abstract

This paper analyzes data obtained from a web-based survey designed to determine the effectiveness of the Ship Structure Committee. The survey was made up of questions focusing on the committee's ability Ship Structure Committee to meet its goal of providing useful technical knowledge and value to the maritime industry and to examine what improvements could be made to further this goal. The survey was broadcast on the committee's website as well as sent through e-mail to known constituents of the committee's programs. Based on the survey results, the SSC continues to meet the needs of a variety of members in the maritime community through out the world and the only common recommendation was to fund more projects. The survey results provide ample justification for ongoing and future support of the SSC.

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Table of Contents

List of Figures and Tables

1. Introduction

In 1946 the United States suffered a series of ship casualties. The Secretary of the Navy was of the belief that these casualties had been caused by structural design flaws and that they were wholly preventable incidents. In response, the Secretary recruited experts to investigate these losses. The final recommendation from the investigative board was to establish an organization to formulate and coordinate research in matters pertaining to ship structure, thus, the Ship Structure Committee (SSC) was born.

The committee disseminated its first report, with design specifications and recommendations to prevent the same structural failures from recurring. Since then the SSC has published over 444 reports in keeping with its goal to be recognized as a credible resource for ship safety. Recently to achieve this goal, the committee developed a web-database where members of the industry can access the SSC's technical reports.

The committee is made up of eight Principal Member organizations; The US Coast Guard, The American Bureau of Shipping, Defence Research and Development Canada, The Society of Naval Architects and Marine Engineers, Transport Canada, Military Sealift Command, Naval Sea Systems Command, and the Maritime Administration.[1] These organizations fund the SSC and make up the voting members who decide which projects the SSC will fund. All Principal members choose projects in the interest of providing valuable and usable information to the maritime community. Additionally, there are 32 liaison member organizations involved with the SSC although they do not participate in voting on which projects will be funded as do the Principal Members.

The SSC research repository provides a depth of historical and valuable technical knowledge as well as recent cutting edge research in the field. The maritime community

[1] www.shipstructure.org

has been relying on the SSC to provide top notch research for the last 60 years and thus the marine community still values the deliverables the SSC provides.

The mission of the Ship Structure Committee (SSC) is to enhance the safety of life at sea, promote technology and education advancements in marine transportation, and to protect the marine environment. The committee strives to achieve its goals through advocating, participating in, and supporting cooperative research and development in Structural Design, Life Cycle Risk Management of Marine Structures, and Production Technologies. The SSC recently conducted an effectiveness survey to research its current ability to meet the needs of the maritime community. The purpose of this paper is to examine the committee's effectiveness in achieving its mission and goals, based on the survey results. It also includes recommendations for future surveys and addresses shortfalls of the survey itself.

2. Effectiveness Study Design and Survey

In the fall of 2005, the SSC teamed with The Columbia Group and EIH Corporation to conduct a study to determine; first, the extent that SSC sponsored work is utilized, second, the added value SSC brings to the shipbuilding industry. And third, do these findings justify future SSC funding requests? In short, if what the SSC does is helpful, worthwhile and effective. An additional goal was to obtain feedback on improvements that could be made to the SSC as a committee and its website. The method of research was done by conducting a survey reflecting the aforementioned themes.

The effectiveness study initially sought to quantify the benefits of SSC sponsored research across the industry. The project design, however, took a slightly different approach. Several iterations of survey questions were written. The survey was cut down from 80 questions to 16 in hopes that keeping it short would promote ease and accuracy of completion. Some of the questions asked respondents about the actual dollar amount the SSC work saved their organization. These were removed from the survey because the

concept of dollar amount was difficult to measure or estimate in this instance. In order to determine a dollar amount SSC research is saving the industry, an estimate of what would be lost in a hypothetical ship structural failure must be determined. The problem is, when a ship suffers a failure, the worth of the cargo, the environmental clean up, the repair costs, or even the massive chain of costs associated with an irreparable ship are all difficult to quantify. Even if these costs were estimated, the traceable links between an SSC report and avoidable costs as it relates to being used to design a ship could not effectively be linked. It is nearly impossible to ask respondents, "How much money did you save by *not* experiencing structural failure?" The difficulty of tracing costs to research meant the study would not be as focused on quantitative values, such as dollar amount. Instead, the survey questions were focused on creating a picture of who uses the website, what qualitative value the SSC provides to them and their suggestions for improvement.

In order to obtain accurate data, the questions were structured in four different ways; there were seven multiple choice questions, two check all applicable choices questions, two rating questions, and five open ended questions-whereby survey respondents had the opportunity to write specific and detailed answers. The open-ended and fill in the blank questions, were focused on the quality aspect of SSC's work as opposed to the quantity of dollars saved. It is undoubtedly true that avoiding structural failure does mean millions of dollars in savings. The amount of specific examples provided by respondents show how SSC research is being utilized and what beneficial impact it is having on the industry.

3. Survey Distribution and Sample Size

The survey was broadcast via e-mail to the approximately 700 people from the committee's mailing list. The e-mail was formatted so that respondents could fill out the survey directly from the e-mail and submit to, EIH Corp., the IT Company who collected the data and managed the distribution of the survey. The survey was also posted on the website so that visitors could not enter the site until they completed the survey. The aim

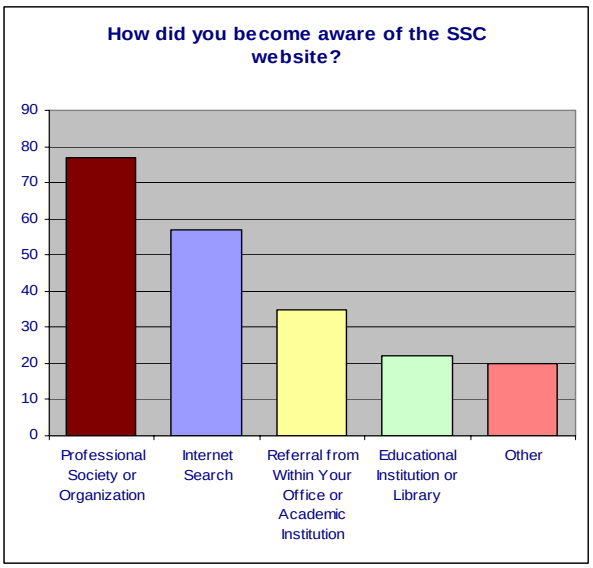
of this method of survey dissemination was to obtain a broad and representative sample size of the website's users. The obligation to complete the survey before entering the site allowed input from first time users, and others who may have been unable to access the survey via their broadcast e-mail or who ignored it.

The problem with using the number of people on the SSC mailing list as an exact sample size is that many people were included in the mailing list that were not necessarily familiar with the website or SSC products. Despite the limitations of the target list, the survey received a thirty percent response rate based on the 700 number. Some survey information was also issued via U.S. Postal Service, and if these mailings are taken into consideration the sample size rises by 300, making the response rate 21 percent. Some of these mailings may have arrived later than the survey was actually online, decreasing this addition to the target sample size. Also, when taken into account the survey was broadcast on the web for two months, this sample population becomes much larger. Thus, the percentage of response is even less. The survey was conducted during the summer months which may have limited responses and some of the letters sent by the U.S. Postal Service may not have reached the potential respondent before the survey was taken off line.

The relevance of the sample size is not merely measured in numbers alone; the quality of the sample group also matters. Overall, based on the survey results and specifically the answer to question one, "How did you become aware of SSC and/or the SSC website?" the survey sample was representative of the web statistics indications. Based on answers to this question, the sample included respondents who are very familiar with the SSC and the website, respondents who had attended SSC events but perhaps never used the website resource, and those who may not be traditional customers, which is to say, first time visitors. Over the course of two months the survey received 211 responses: three-fourths came from repeat users, and approximately one-fourth of the response from first time visitors.[2]

[2] Appendix B, "SSC Survey General Analysis", Question 1

Figure 1: How did you become aware of the SSC website?



Question 1	Response	%
Professional Society or Organization	77	36.49%
Internet Search	57	27.01%
Referral from Within Your Office or Academic Institution	35	16.59%
Educational Institution or Library	22	10.43%
Other	20	9.48%

These responses were in line with the web trends data and prove that those who took the survey were representative of typical visitors to the website. Thus, the quality and statistical validity of the study's sample size is sufficient to draw conclusions from the survey responses.

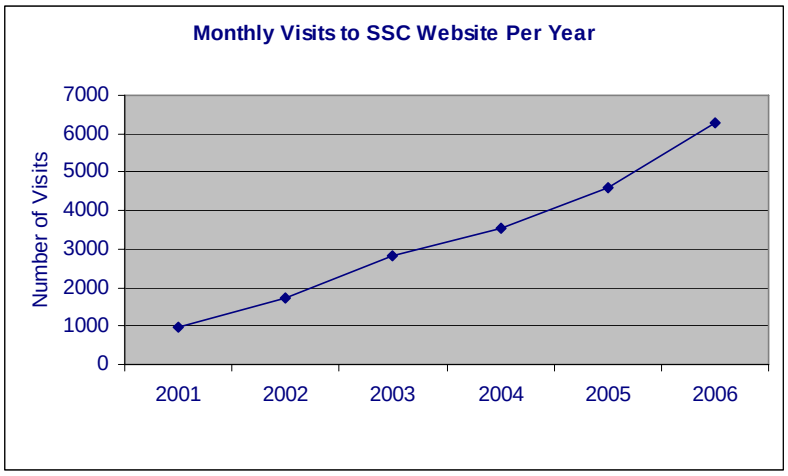
Unfortunately, due to the structure of web statistics, it is not possible to determine the amount of people who actually visited the site during the time the survey was posted, and use this number for the purposes of comparing response rate with sample size. The data retrieval process works by counting "unique visitors", "pages viewed" and "hits" none of which are precise estimates of how many people are accessing the site. "Hits and Pages viewed" measure the number of files requested from a website, these are good statistics to consider when looking at overall website usage, but not helpful for the purposes of determining a sample size. The term "unique visitor" is misleading. Unique visitors are measured in terms of IP address, which are unique; these are counted only once no matter how many times the person visits the site. The problem with using this to

determine the sample size via "unique visitor" web statistics, is that certain internet service providers, use what is called Dynamic Host Configuration Protocol, this uses a different IP address for every file requested, skewing the data to make one actual unique user look like many. Thus, the web statistics could only go so far in providing a picture of who uses the website, and are irrelevant in determining the sample size.

4. Web Trends Data

Web trends are the statistical data that track where the visitors are referred from and what information they access. While there are some shortfalls with web trends in terms of specifics, their historic general trends can be used to get a feel for overall usage for the site. The committee has been consistent in tracking the same type of web trends since its inception. This consistency allows web trends to be used as a valuable supplement for the topics discussed in this section. Web trends data was used to supplement survey findings, demonstrating the profile of SSC website traffic. Web trends data from 2003 forward was used for this analysis. Since 2003 the site has received an average of 135.4 visits per day, 2,733 per month, with an average 10:58 as the length of visit. These trends are indicators that the website's usage has increased from the site's inception to 2006.

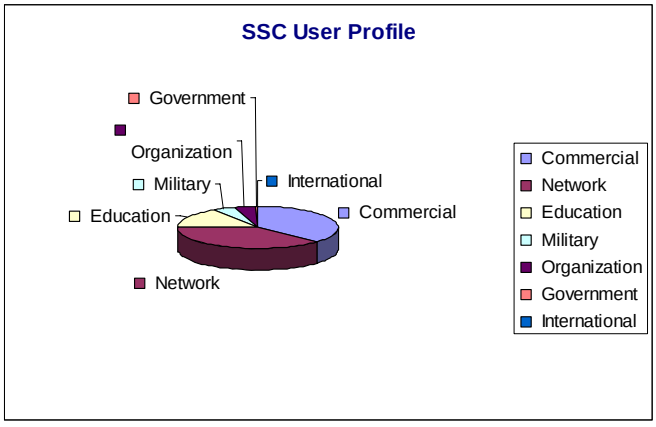
Figure 2: Monthly Visits to SSC Website per Year



Many of the benefits and shortfalls of these web trends data were mentioned above in the discussion of the survey's sample size. While the data is not sufficient in determining an exact sample size, the data does depict from where users are visiting. From 2003 forward the data shows that the most frequent visitors were directed from a commercial domain. Military and educational domains, and networks, also had a significant amount of usage. One issue with this statistic is that commercial domains can be that of widely used search engines. The website traffic indicates that users are coming from the SSC's target audience, the military, educational and commercial users of ship structure technology. While the commercial or "dot com" statistic would indicate more survey participants directed from the commercial domain, it is understandable that some users from these domains would overlap. For example, a person working at a navy facility or a university researcher may use a major search engine to search for the Ship Structure Committee and thus be directed from a "dot com" page, when they would more accurately be described as a military or academia user. This is yet another challenge to answering the question, "who are our users." These web trends do show substantial referral from search engines to the SSC page indicates that SSC is on the right track in keeping research accessible to both known and potential users.

The number of hits from search engines and “dot com” domains also proves that users unfamiliar with the SSC can be directed to the site as a resource when searching keywords dealing with ship structure. Despite the difficulties in finding exact numbers from web statistics, the overall web trends data profile compliments question number one in the survey that the survey reached a representative sample group in line with who our users have been over the past three years.

Figure 3: SSC User Profile



The majority of those who responded to the survey visited the SSC website at least monthly. And although some respondents had been referred to the site from an internet search, 36 percent were referred by their professional/technical society or organization.[3]

Figure 4: Monthly Website Traffic

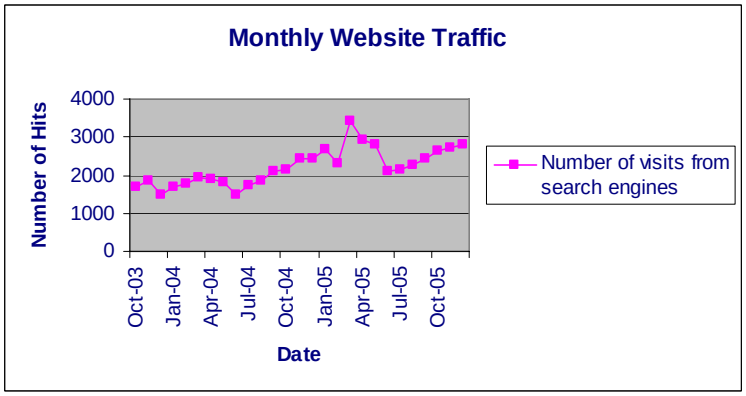
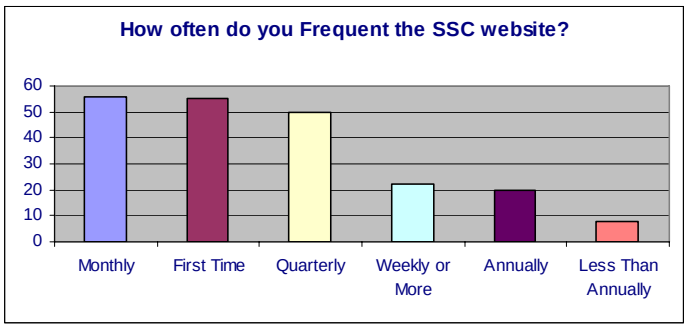


Figure 5: How often do you frequent the SSC Website?

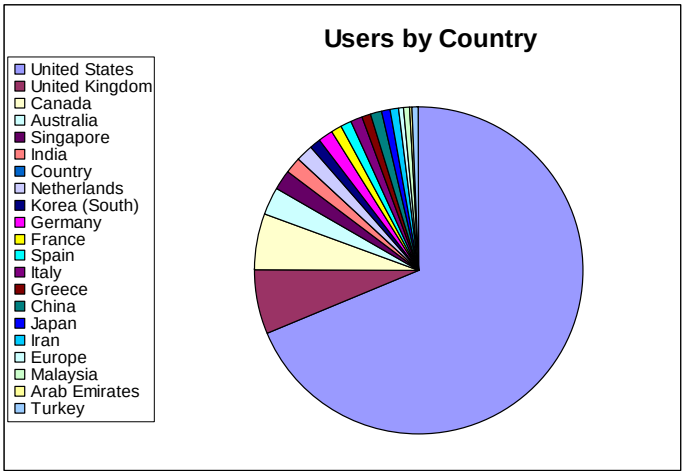


Question 2	Response	%
Monthly	56	26.54%
First Time	55	26.07%
Quarterly	50	23.70%
Weekly or More	22	10.43%
Annually	20	9.48%
Less Than Annually	8	3.79%

[3] Appendix B, "SSC Survey General Analysis, Question 2

The study also sought to determine the extent of the international use of the website. In this figure, "Users by Country", the top twenty countries of origin of the visitors of the SSC are displayed, going back to 2001. As with many industries, the shipbuilding process is being affected by globalization. Different structural components for the same ship may be designed in one country, and built in others. This could be a potential area of expansion for the SSC research, and it would be beneficial to expand funded research reports from international users of the website.

Figure 6: Website Users by Country



Survey Results: General Questions

Question One: How did you become aware of the SSC website?

The majority of survey respondents learned of the SSC site through their professional society or organization at 36 percent, however, only trailing by a few were the 27 percent referred by an internet search. This 27 percent is in close proximity to the 26.07 percent who responded that they were first time users (question two). The majority of first-time users were most likely referred to the site via internet search, as aforementioned and confirmed by web trends data. Of the 156 respondents that did not consider themselves first-time users, about half (49 percent) were referred by their

professional/technical society or institution, 22 percent were referred by their office or academic institution, 14 percent were referred by their educational institution or library and 12 percent mentioned "other" for their referral source. It might be useful in the future to add a survey question asking if respondents are Principal Members. This was not given as an answer choice in this survey, but would be useful in further attributing who uses and visits the website as well as how likely principal members are to respond to the survey, which is to say, how much of the sample group is made up of principal members?

One problem with this question is that the answer choice "referral from within your office or academic institution" could overlap with "educational institution" dependant upon how an individual distinguishes between educational and academic institutions. The answer choice "office" could have been better used if not included in the "office or academic institution" phrase. With these changes we would be able to have a better picture of who was being referred for educational purposes, against those who may view the site that was referred through their office, which is also very broad. The question could have been better used if the answer choices included military bodies as well, since members of the Navy and Coast Guard are involved in the SSC. Another suggestion to improve the study of who the SSC users are is to ask this in an open ended format, and perhaps in two stages. The first being, how you were referred to the SSC website, and the second, to give the current place of employment.

The data that was collected through this question shows that the SSC's primary users are from professional/technical societies and organizations, and those using internet search engines. This is a good indication that the SSC website is being used by people whose organizations are involved in the products promoted by the SSC, as well as those that may not be directly involved but who access SSC research when searching from common engines. The SSC association with professional conferences such as the SNAME Annual Meeting is worthwhile since the highest percentage of respondents became aware of the website through their professional and technical societies or organizations.

Question Two: How often do you frequent the SSC website?

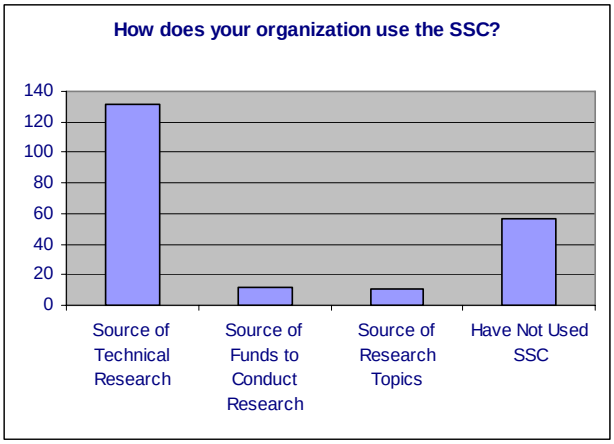
Most respondents visit the website at least monthly, at 26.54 percent. While the website is updated frequently, requests for research recommendations and published reports are posted upon receipt of approval. The major products the SSC provides are the published reports, thus, it is a positive indicator that the respondents frequent the site on a monthly to quarterly basis only to see that period's new postings. Those who frequent the site monthly are most likely referencing multiple reports from the site, and utilizing the SSC's research repository when technical challenges arise throughout the year in their profession or studies.

Question Three: How does your organization primarily use SSC?

The first theme of the study was to understand how the various SSC website visitors use SSC sponsored work. Question three asked, "How does your organization primarily use SSC work". The results showed that those using SSC furnished information as a source of technical research is by far the number one use. Given there were 55 first time users, of the 154 people that use the SSC, 131 of the 154, or 85 percent, used it as a source of technical research. This is indicative of the valuable resources the website provides for experts in the field. These results validate the primary mission of the committee, providing a quality source for accessing technical research.[4] An example of a user who is interested in technical research would be a welder in a shipyard, looking for pertinent research on welding techniques. A user interested in a source of research topics might be, for example, someone doing research for a documentary project on a particular structural casualty such as the Derbyshire.

[4] Appendix B, "SSC Survey General Analysis", Question 3

Figure 7: How Does Your Organization Use the SSC?



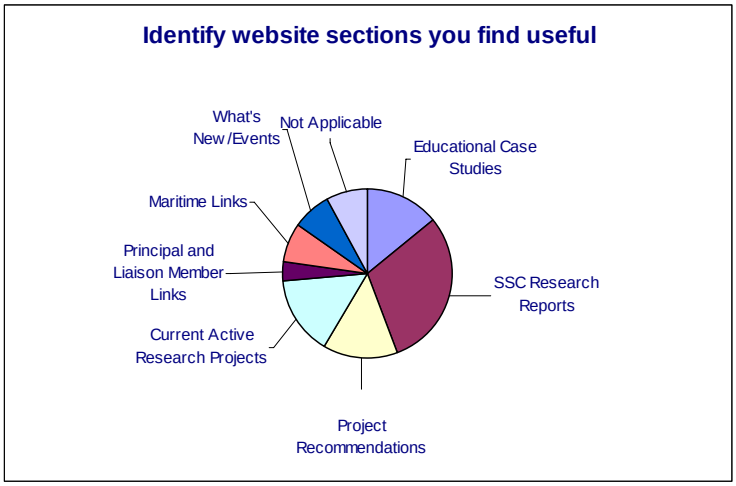
Question 3	Response	%
Source of Technical Research	131	62.09%
Source of Funds to Conduct Research	12	5.69%
Source of Research Topics	11	5.21%
Have Not Used SSC	57	27.01%

Question Four: Identify the following SSC website sections you find useful.

The subsequent goal of the survey was to attribute how these technical reports provided value to the maritime industry. Respondents were asked to identify all applicable website sections a constituent found useful, (more than one choice could be made) out of the following options; educational case studies, research reports, project recommendations, current active research projects, principal and liaison member links, maritime links, what's new, events, and not applicable. The survey received a 74 percent response for research reports providing significant value. Ignoring the 55 first time users, this brings the response rate to over 100 percent for the usefulness of research report. Given the margin of error, some first time users have chosen the research reports even though there was a "not applicable" designed for their selection. Many of these respondents were also interested in the current active research projects, educational case studies and project recommendations. This data is a good indicator that website users find the most value in the website as an electronic research repository. In fact, this data can be confirmed by referring to the web trends data of the past three years. For example, the

top five downloaded reports have averaged over 6,000 downloads each and educational case studies are viewed an average of 50 times per day.[5]

Figure 8: Identify Website Sections You Find Useful



Choose All Applicable	Response	%
Educational Case Studies	74	35.07%
SSC Research Reports	156	73.93%
Project Recommendations	74	35.07%
Current Active Research Projects	80	37.91%
Principal and Liaison Member Links	18	8.53%
Maritime Links	40	18.96%
What's New/Events	38	18.01%
Not Applicable	41	19.43%

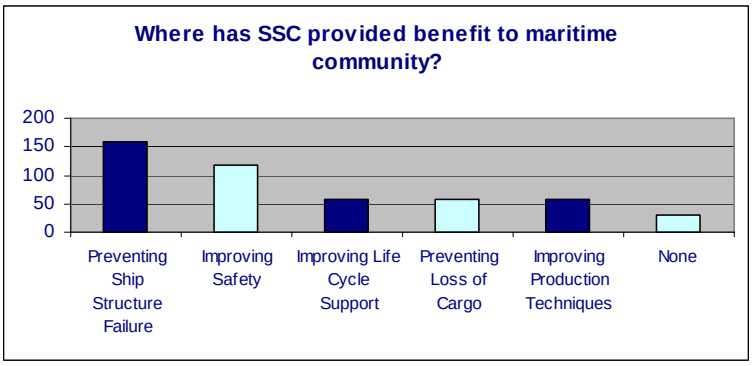
Question Five: Where has SSC sponsored work provided benefit to the maritime community?

When asked which areas the SSC has provided benefit to the maritime community responses were clear in answering that the SSC is useful in preventing ship structure failure and improving safety, both of which provide value by decreasing the life-cycle cost of maintaining a ship. This is another affirmation that the committee's primary goals are being achieved.[6]

[5] http://www.shipstructure.org/webstats.xls Appendix B, "SSC Survey General Analysis", Question 4, Appendix C, "SSC Report Download Statistics" and Appendix D, "SSC Educational Report Download Statistics"

[6] Appendix B, "SSC Survey General Analysis", Question 5

Figure 9: Where has the SSC Provided Benefit to the Maritime Community?



Question 5	Response	%
Preventing Ship Structure Failure	158	74.88%
Improving Safety	118	55.92%
Improving Life Cycle Support	58	27.49%
Preventing Loss of Cargo	58	27.49%
Improving Production Techniques	57	27.01%
None	31	14.69%

When asked, "Where the SSC provided benefit to the maritime community", 55 percent of respondents answered that the SSC's research is the key to improvement of ship safety, and approximately 27 percent said that the research improves life cycle support and production techniques of ships. Approximately 15 percent of respondents said that the SSC provided no value. This response was chiefly representative of first time visitors as this question did not have a clear answer choice geared toward first time visitors. This question could be re-framed if used again in future surveys, there should be an option for first time users. It also may be beneficial to have the first time user directed to the SSC website after the first question. In the process of creating this survey, there was debate as to whether or not some of the first time users of the website may actually be familiar with SSC publications in hard copy, or other SSC programs and could still provide beneficial responses to the remaining survey questions. However, the results of this survey suggested otherwise, that most first time users were referred by a search engine and were unfamiliar with SSC to the extent that their responses would not be useful for the remaining questions.

Given that 75 percent of respondents stated that the SSC provides benefit to the maritime community by preventing ship structure failures, the cost associated with the loss of a ship and its cargo infinitely surpasses the investments made by the SSC principal member organizations to conduct this research.

Question Six: Please supply one or more examples of the value provided from SSC programs.

The effectiveness study survey asked respondents to "supply one or more specific examples of the value provided as a result of SSC programs, funded research, published SSC research reports, SSC website, conferences, and committee discussions, etc." Over 54 percent of survey respondents took time to give specific and substantial examples of valuable SSC programs.[7]

"The SSC approach to research management is the best I've seen anywhere."

Many of these responses provided detailed use of SSC reports ranging from historical studies to recent published reports that provide "state of the art" and "leading edge" information for the industry. In fact, one response stated, "The SSC sponsored the POLAR SEA and POLAR STAR icebreaker trials back in the 1980s. These were and remain the best icebreaker trials ever conducted and define the state of the art, even though many more trials were conducted subsequently. Many SSC projects have similarly defined the state of the art in their topics (risk, fatigue, limit states etc.) The SSC gives each project a client that cares about the work and helps the researchers by proving not only useful input, but also a sense of validity and importance that is often lacking in granting council projects. And yet the SSC projects let the researchers stay focused on the science and not on immediate commercial concerns."

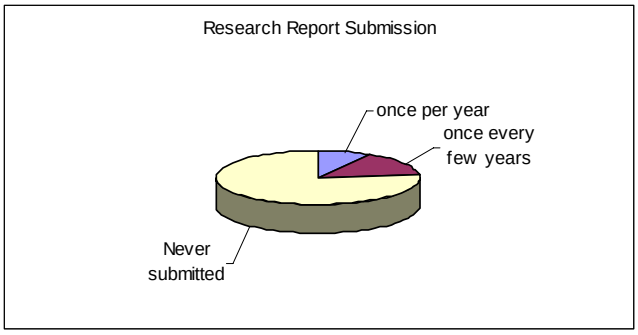
"I have gained an education on ships hull matters that will assist my organization in better serving its clients. I have also introduced this website to many of our maritime engineers so that they can enjoy its benefits."

"Excellent references that can be used for international benchmark analysis and for our own model calibration. We used SSC report in the field of ultimate strength."

[7] Survey Data

Question Seven: How often have you submitted a research recommendation to the SSC for their funded research initiatives?

Figure 10: Research Recommendations Submitted



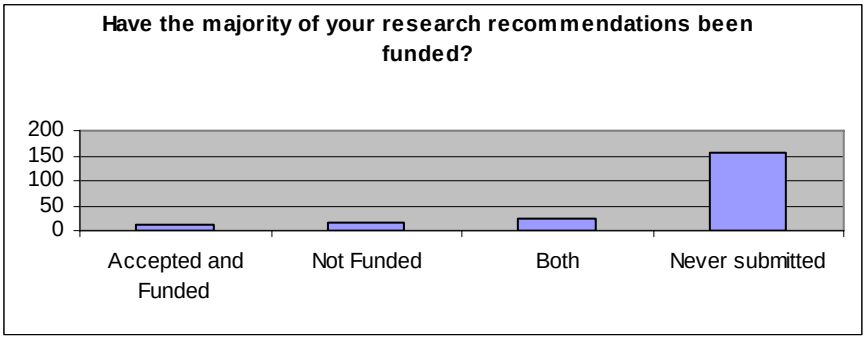
The survey asked two questions regarding research recommendations. The first to get a picture of how frequently users were submitting research reports to the SSC and the second to see how many of their projects have been funded. The overwhelming majority of respondents said they had never submitted research recommendations to the committee. Only 8.53 percent submitted research recommendations annually and about 15 percent had submitted recommendations at some point. It is not surprising that over 76 percent had never submitted recommendations, these include first time visitors. That leaves another 40 percent, familiar with the committee's work that are using research, but not necessarily proposing new research topics for the committee to explore. In sum, users that are not receiving funding from the SSC utilize its research. A goal for future improvement could be greater advertising of research proposals and opportunities.

Question Eight: Have the majority of your research recommendations been accepted or rejected by the SSC?

The majority of respondents to this question answered that they had never submitted a research recommendation. Over 11 percent had submitted multiple recommendations and some had been funded, others not funded. Only eight percent responded that their recommendations had not been funded. This shows that 17 people

had submitted recommendations and never been funded, they still utilize the website and even took the time to take the survey. These statistics show that people are still utilizing the website and SSC products despite lack of funding for their own proposals.

Figure 11: Research Recommendation Funding



Question 8	Response	%
Accepted and Funded	12	5.69%
Not Funded	17	8.06%
Both	25	11.85%
Never submitted	157	74.41%

However, if the first time users are eliminated from this analysis, this brings the number of people that have used the SSC, but never submitted a request to 102. This indicates that slightly over half of the SSC survey respondents are requesting funding. One objective is to expand the website's use among more than a few contacts within the member organizations and maritime community as a whole. The 157 answering "never submitted" differs from the previous 161 who gave this answer. This differential is within the margin of error.

6. Future Improvements

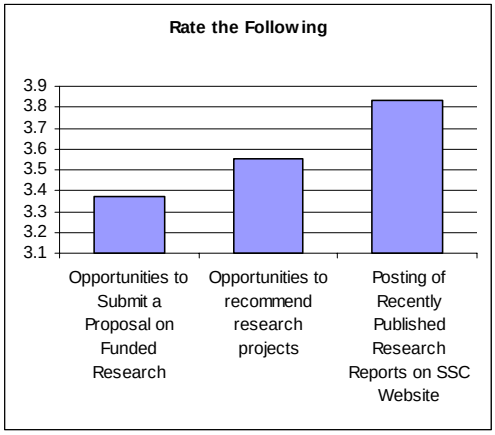
Question Nine: Please rate how effectively SSC communicates the following…

Question nine asks respondents to rate the committee's ability in communicating opportunities to recommend research projects, opportunities to submit a proposal on funded research and opportunities to publish research reports. All of these ratings were around 3.5 on a scale of one to five, five being the best and one being the worst, with the posting of recently published research reports being rated slightly greater at 3.8 and the opportunities to submit a proposal on funded research slightly lower at 3.37. These

responses show that the SSC could better communicate the opportunities for proposal and research recommendation submittal. The responses also concur with other questions dealing with how the SSC is used and valued, here the value of using the site to view published research reports is the primary focus of site users. Disregarding the first time user response, the ratings were slightly higher but relatively similar to each other, in terms of the SSC's communication, the posting of recently published research reports is the most highly rated.

Figure 12: Effective Communication

Response	Average Rating	No Response	% NR
Opportunities to Submit a Proposal on Funded Research	3.37	94	45%
Opportunities to recommend research projects	3.55	93	44%
Posting of Recently Published Research Reports on SSC Website	3.83	89	42%



Question Ten: Please rate the SSC's website for the following areas; content, search ability and usefulness.

The SSC's content, search ability and usefulness all received high ranking. Content rated the highest with 4.12, usefulness ranked 4.07 and search ability ranked slightly lower at 3.68. Some answers to question eleven regarding website enhancements directly relate to the lower rating for website search ability, as respondents would like to see improvements in this area. There are many ways in which the search ability could be enhanced on the website without resulting in a particularly high labor cost. A few enhancements of the website will be implemented in the near future. These enhancements will improve search ability and ease of downloading reports.

Question Eleven: What website enhancements would be of value to you and your organization?

Although thirteen users out of the 48 users, 27 percent, who provided specific examples, responded that the committee is providing significant value to the maritime industry, respondents also had suggestions on how to improve the website. The survey asked respondents an open-ended question regarding improvements users would like to see moving forward, in order to promote continuance in providing high level technical information through the website.

The responses indicated that nine users, or 18 percent of those who provided specific responses, would like to see updates to previously published reports. Of these 12 users, or 25 percent of those who provided specific response to question 11, would like to see enhancements and increased website-search capability. Most importantly the majority of those who provided specific examples, 14 responses making up 29 percent, would like to see an increase in SSC research report publication. With respect to updates and search ability, the committee is already planning on implementing several programs for enhancing these aspects of the site.

Question Twelve: SSC's current goal is to "support cooperative research and development", is there any other means by which our goal could be reached?

Out of the 49 respondents who provided specific examples, seven or 14 percent, suggested that more international cooperation would be beneficial. The responses mentioned creating relationships with ONR Global, based in London and the ISSC. Other suggestions included a web discussion forum, a web based photo gallery of structural problems with brief explanations. The most frequent response theme dealt with research project collaboration with various other organizations such as the Navy, American Bureau of Shipping, universities and even private vessel owners, with 15 responses, or 30 percent. This could be done through web-seminars/platforms, distribution of SSC information in trade

"Reaching organizations/institutions actively involved in research by inviting them to participate in a platform where research ideas are interchanged would be helpful."

journals and websites throughout the industry. It is recommended that the SSC follow up with individuals who provided comments in order to obtain clarification and further suggestions regarding their survey responses since some of the comments were suggestions to implement items that are already in place.

Question Thirteen: Are there website links you would like to see added to the SSC website?

The majority of responses to this question dealt with participants wanting to see more links to industry-wide journals and industry publications. Of those who gave specific feedback, four users or 16 percent suggested links to journals and industry publications. Of the 25 users who gave specific feedback, 19 or 76 percent, responded that links to international maritime industry organizations, specifically European and Asian institutions were recommended. Another three responses, or 12 percent, would like to see links to events or conferences pertaining to the industry. Of these conference recommendations those hosted by the Society of Naval Architects and Marine Engineers were mentioned the most frequently.

Adding links to these various organizations would be a cost effective benefit to the SSC website. Generating more frequent use is one way to assure that the research is being used throughout the industry. One way to encourage more frequent visits to the site would be to add these links and updates so that something new can be seen at least weekly on the site. A news ticker or scrolling wheel with articles pertinent to the maritime industry would also be an effective way to enhance the site for this purpose of encouraging repeat website visitors.

Question Fourteen: Please supply comments or suggestions "on how we can better serve" the SSC community.

Of the total responses to question 14, only 10 percent were legible and specific, perhaps because people were ready for the survey to be over at this point, or perhaps because their suggestions were captured in the previous open-ended questions. The

responses ranged from expanding education and training, linking with educational institutions, to expanding the committee to involve international organizations focused on similar goals relating to ship structure. Others would like more reference material on the site, or links to industry magazines. Publishing information in industry journals was also recommended. A common thread through many of these responses was to gain more exposure for the SSC among industry organizations. One participant in particular wrote that publicity of the committee and what it does is important, but before this can be done the SSC should clearly define who its users are, and how to best reach out to them. Using the results of this study, the number of first time users is important. A focus area for SSC enhancement could be how to get first time visitors to not only repeat visit, but to be involved in the committee's work. One question that may need to be asked first is what role these users play in the industry. As aforementioned, in subsequent studies a question about the participant's place of work, education and industry affiliation would be useful in learning more about these first time users, and the user population as a whole.

Some respondents also recommended they would like the committee to host more frequent seminars. The number one response, worded in various fashion was to increase the number of project the SSC funded each year. This is a costly endeavor and first must be dealt with through increased funding. Although the committee runs on very low overhead, the funding does not compensate with the amount of quality research recommendations and potential publications.

There were also many positive responses to this question in that the SSC is already providing a great product and no enhancements are needed. One respondent in particular used this opportunity to say that not only did he see no need for website enhancements; he thought the SSC's research on the use of large scale steel was particularly valuable to his organization and that the research was used in conducting over 150 tests to the material. These qualitative responses gave a few suggestions for improvement, some more costly than others, but more importantly validated that many SSC users are quite content with the committee's website and research products.

Question Fifteen: Have you ever attended an SSC symposium? Question Sixteen: What is a primary factor that would influence your decision to attend SSC Symposia?

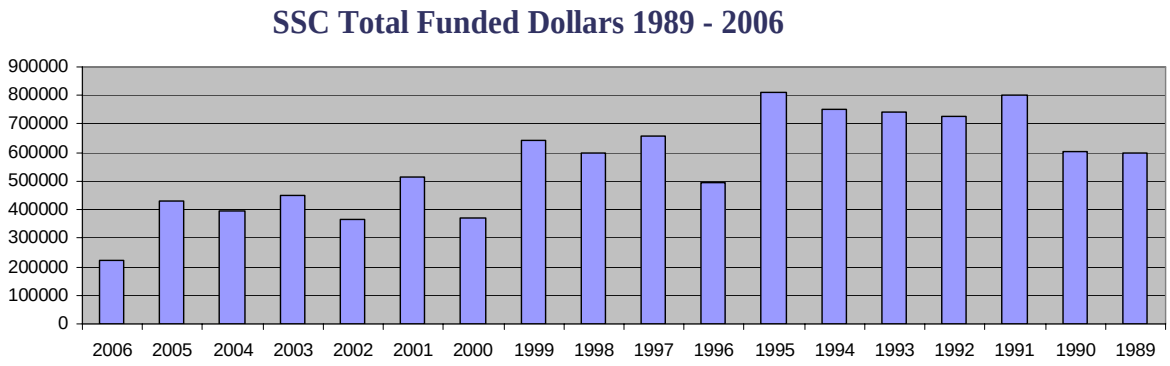
These final two questions were designed to examine the services that SSC provides to the maritime community aside from being a research repository. The majority of users responded that they had not attended a symposium, however 22.75 percent had attended. Of the 77.25 percent who had not attended only 15 percent responded that they were not interested in attending a symposium. The majority of respondents who were interested in attending were foremost concerned with the agenda of the symposia and secondly with the cost and location. Some of these responses are dependent upon each other; the cost could be linked to location, and agenda to speakers. This provides focus areas for the committee when planning future symposia.

7. Funding

The issue of funding for the committee's papers was examined after analysis of the survey results, since additional funding was a common suggestion in the room for improvement questions. Users would like to see more publications, yet only a few of the desirable projects can be funded each year limiting the amount of reports that can be published by the committee. One constituent remarked, “If these projects would receive the support of the SSC, invaluable aid would be available to the marine community in addition to the agencies funding the project.”

The historical data shows the differences in total funding in dollars for SSC programs. The data shows that funding has generally decreased from 1989 to 2006. With this decline in funding, the SSC was forced to decline the number of projects that could be published.

Figure 13: SSC Funding History



Organizations who invest in SSC research can be assured that with the committee's low overhead and low operational costs investment dollars are focused on publishing the most valuable reports. The chief challenge the committee faces is that it is only able to fund a limited number of quality research papers each year.

For much of the past century, the primary material used in shipbuilding has been steel. Many of the structural failures of the 1940s are not seen today because steel is such a well understood component throughout the shipbuilding industry. Today, there are many new materials used in the shipbuilding process that are not understood as well as steel. Thus, SSC promotes research reports and educational studies on these new materials. By providing research on these components, the SSC continues to provide engineers with shipbuilding information that will result in fewer costly structural flaws, and lower life-cycle management costs of ship maintenance. This type of research is particularly important to the maritime industry.

The survey asked users in the survey what role research recommendations played in their involvement with the SSC. It is important to note that the same members, who responded to have seldom or never submitted a request, also greatly value reports that are accepted and funded. Many responses to the open ended question, “what can SSC do to improve or enhance its programs”, were to simply publicize more reports. SSC is doing

an excellent job of funding structural projects despite its limited budget, yet constituents would like to see more.

8. Conclusion

Given that the major structural failures associated with the World War II merchant ships in the 1940's have virtually disappeared, the SSC has expanded and shifted its focus over the years attempting to meet the current issues facing the maritime community. The SSC took the occasion of its 60th anniversary to conduct a 16 question survey to see if its user's needs are still being met with the research sponsored by the SSC and respondents were given the chance to suggest recommendations for improvement. Based on the survey results, the SSC continues to meet the needs of a variety of members in the maritime community through out the world and the only common recommendation was to fund more projects. The survey results provide ample justification for ongoing and future support of the SSC.

Appendix A: Survey Questionnaire

Structure Committee Questionnaire for Effectiveness Study

Introduction

The Ship Structure Committee (SSC) is performing an effectiveness study to assess our performance relative to the stated mission and to obtain input from you regarding SSC priorities over the next few years.

SSC Mission

To enhance the safety of life at sea, promote technology and education advancements in marine transportation, and to protect the marine environment. This will be done through advocating, participating in, and supporting cooperative research and development in structural design, life cycle risk management of marine structures, and production technologies.

Effectiveness Study

Please provide your input to the effectiveness study questions below. Your participation will guide the continued improvement of SSC funded research, publications, and networking. For background information on SSC, please visit www.shipstructure.org

IMPORTANT DISCLAIMER AND INFORMATION:

- You are receiving this survey because you are familiar with the Ship Structure Committee. **Please DO NOT REPLY to this email message.**
- Complete the survey and please **make sure to click the Submit button** at the end of the survey. The survey data **will not be received by SSC** if the Submit button is not clicked.
- If you have any questions, please contact SSC

BEFORE COMPLETING THE SURVEY, PLEASE READ THIS IMPORTANT TECHNICAL NOTE:

Some older versions of Microsoft Outlook as well as some web based email systems may not be able submit data entered on the survey. Please click on the "Test" button Test **to check whether your system can send the survey data to be processed. If the test is unsuccesful, or if you wish to take the survey on a browser window, please click here**

General Questions

1) How did you become aware of SSC and/or the SSC website

- ☐ Professional/technical society or organization
- ☐ Referral from within your office or academic institution
- ☐ Internet Search
- ☐ Educational institution or library
- ☐ Other

2) How often do you frequent the SSC website?

- ☐ Weekly or more
- ☐ Monthly
- ☐ Quarterly
- ☐ Annually
- ☐ Less than annually
- ☐ I am a first time visitor

3) How does your organization primarily use SSC?

- ☐ Source of technical research
- ☐ Source of funds to conduct research
- ☐ Source of research topics (ie. Thesis preparation)
- ☐ Have not used SSC

4) Identify the following SSC website sections you find useful. Select all applicable choices.

- ☐ Educational case studies
- ☐ SSC Research Reports
- ☐ Project Recommendations
- ☐ Current active research projects
- ☐ Principal and liaison member links
- ☐ Maritime Links
- ☐ What's New / Events
- ☐ Not Applicable

5) Based on your experience and observations, where has SSC sponsored work provided benefit to the maritime community? More than one selection may be made.

- ☐ Preventing ship structure failure
- ☐ Preventing loss of cargo
- ☐ Improving safety
- ☐ Improving production techniques
- ☐ Improving life cycle support
- ☐ None of the above

6) Please supply one or more specific examples of the value provided as a result of SSC programs, funded research, published SSC research reports, SSC website, conference, committee discussions, etc.

7) How often have you submitted a research recommendation to the SSC for their funded research initiatives?

- ☐ Once a year on average
- ☐ Once every few years
- ☐ I have never submitted a research recommendation (proposal) to SSC

8) Have the majority of your research recommendations been funded or not funded by the SSC

- ☐ Accepted and funded request
- ☐ Non-funded request
- ☐ Both, some of my requests have been accepted and funded, while others have not been funded.
- ☐ I have never submitted a research recommendation to SSC

Future improvements

9) Please rate how effectively SSC communicates the following: (1 being lowest, 5 being highest, and NR for no response.)

- Opportunities to recommend research projects **[** ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ NR **]**
- Opportunities to submit a proposal on funded research **[** ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ NR **]**
- Posting of recently published research reports on the SSC website **[** ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ NR **]**

10) Please rate the SSC's website for the following areas: (1 being lowest, 5 being highest and NR for no response)

- Content **[** ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ NR **]**
- Search ability **[** ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ NR **]**
- Usefulness **[** ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ NR **]**

11) What website enhancements would be of value to you and your organization?

12) SCC's current goal is to "support cooperative research and development" is there any other means by which our goal could be reached?

13) Are there website links you would like to see added to the SSC website?

14) Please supply comments or suggestions "on how we can better serve" the SSC community.

15) Have you ever attended an SSC Symposium?

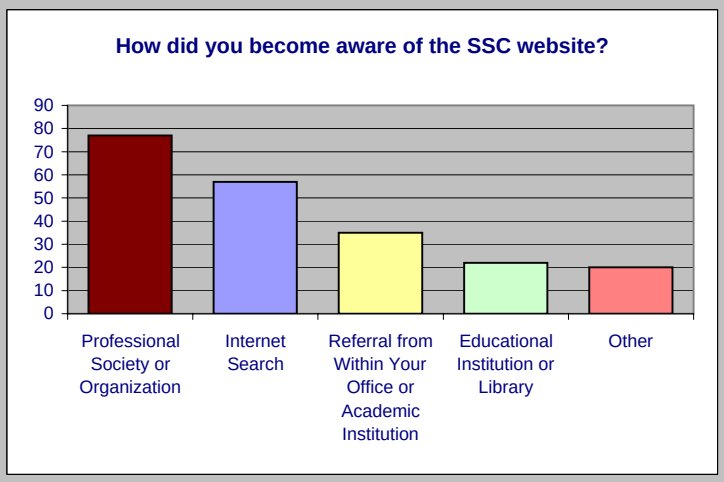
- ☐ Yes
- ☐ No

16) What is a primary factor that would influence your decision to attend an SSC Symposia?

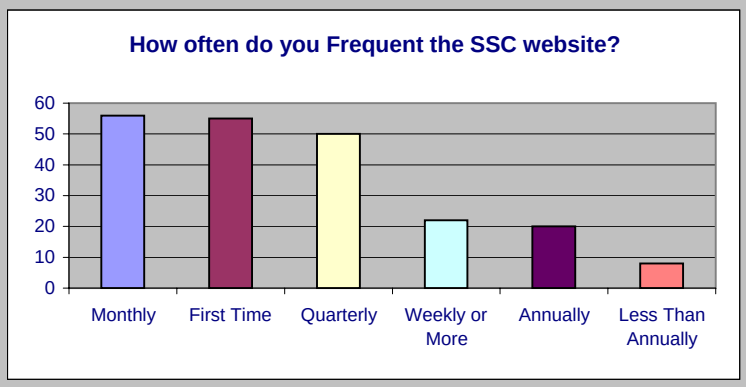
- ☐ Agenda
- ☐ Speakers
- ☐ Cost
- ☐ Location
- ☐ Other (please specify)
- ☐ Not Interested in Attending

SSC EFFECTIVENESS SURVEY GENERAL ANALYSIS 09/08/2006

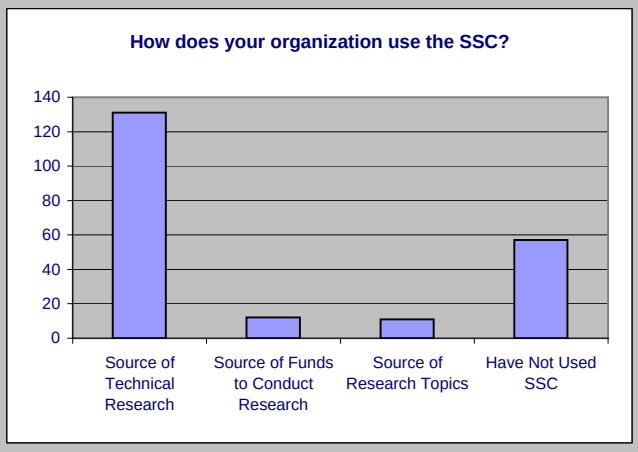
Question 1	Response	%
Professional Society or Organization	77	36.49%
Internet Search	57	27.01%
Referral from Within Your Office or Academic Institution	35	16.59%
Educational Institution or Library	22	10.43%
Other	20	9.48%



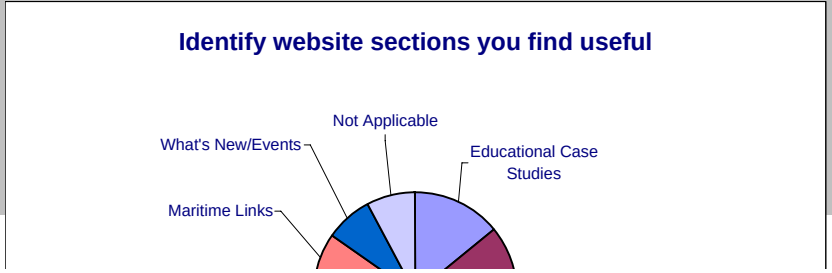
Question 2	Response	%
Monthly	56	26.54%
First Time	55	26.07%
Quarterly	50	23.70%
Weekly or More	22	10.43%
Annually	20	9.48%
Less Than Annually	8	3.79%



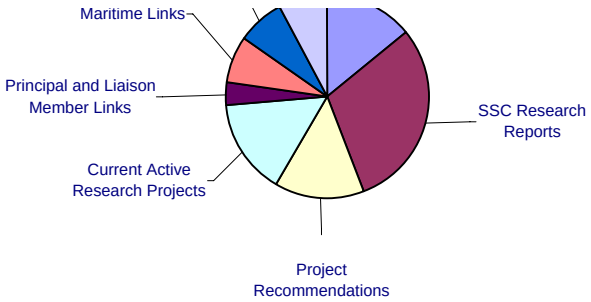
Question 3	Response	%
Source of Technical Research	131	62.09%
Source of Funds to Conduct Research	12	5.69%
Source of Research Topics	11	5.21%
Have Not Used SSC	57	27.01%



Question 4 Choose All Applicable	Response	%
Educational Case Studies	74	35.07%
SSC Research Reports	156	73.93%
Project Recommendations	74	35.07%

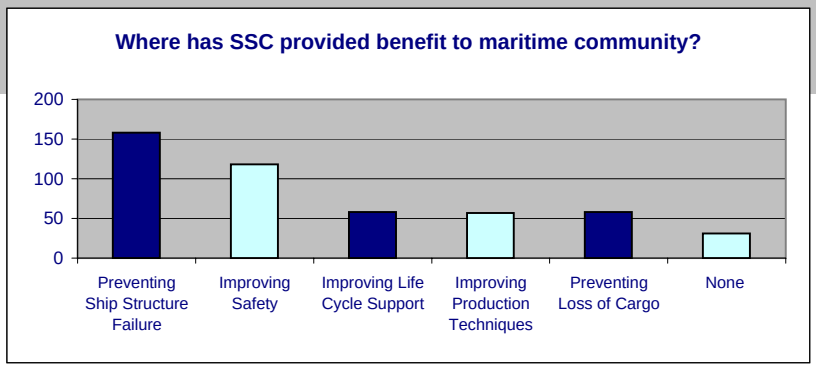


Current Active Research Projects	80	37.91%
Principal and Liaison Member Links	18	8.53%
Maritime Links	40	18.96%
What's New/Events	38	18.01%
Not Applicable	41	19.43%

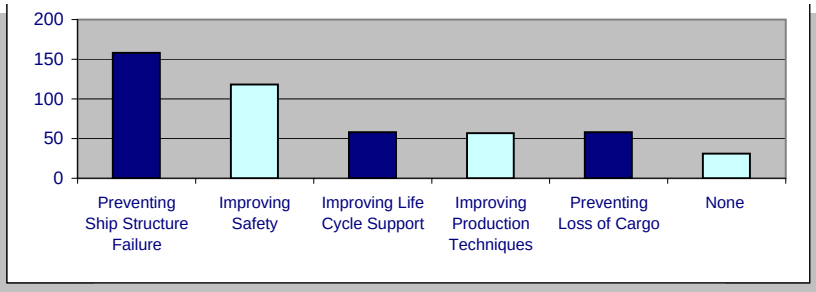


Question 5 **Response** **%**

Preventing Ship Structure Failure	158	74.88%

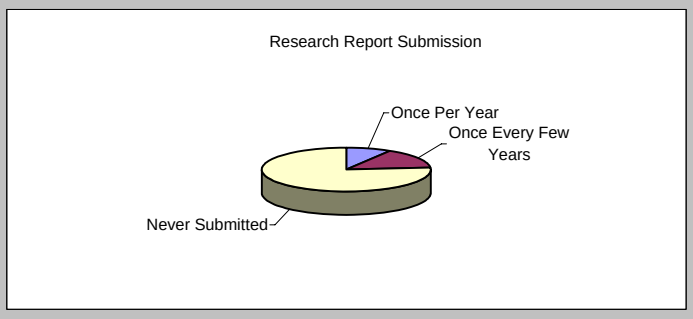


Improving Safety	118	55.92%
Improving Life Cycle Support	58	27.49%
Improving Production Techniques	57	27.01%
Preventing Loss of Cargo	58	27.49%
None	31	14.69%



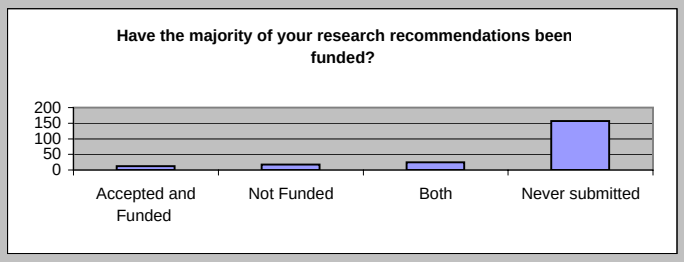
Question 6 Specific Examples of Value Provided

N/A or Illegible	73	34.60%
Specific examples	138	65.40%



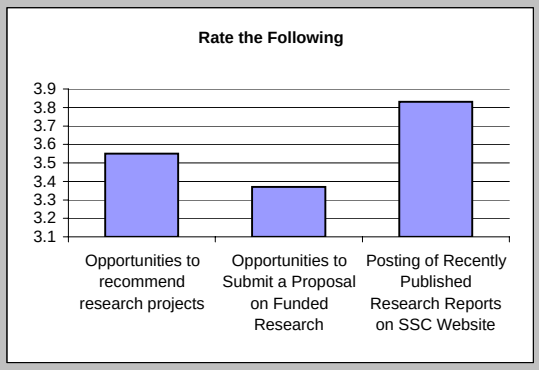
Question 7	Response	%
Once Per Year	18	8.53%
Once Every Few Years	32	15.17%
Never Submitted	161	76.30%

Question 8	Response	%
Accepted and Funded	12	5.69%
Not Funded	17	8.06%
Both	25	11.85%
Never submitted	157	74.41%



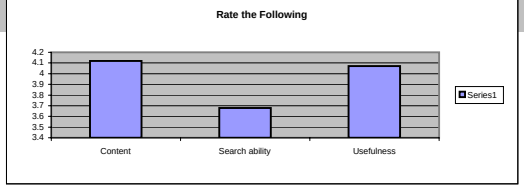
Question 9

Response	Average Rating	No Response	% NR
Opportunities to recommend research projects	3.55	93	44%
Opportunities to Submit a Proposal on Funded Research	3.37	94	45%
Posting of Recently Published Research Reports on SSC Website	3.83	89	42%

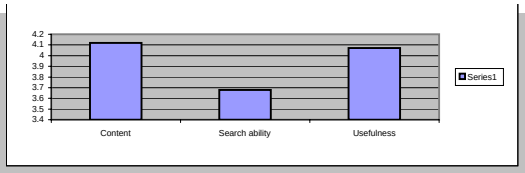


Question 10

Response	Average Rating	No Response	% NR

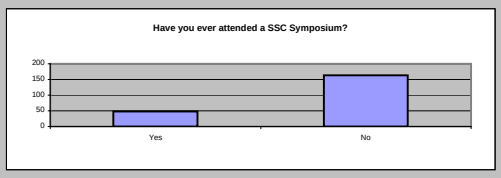


Content	4.12	68	32.23%
Search ability	3.68	69	32.70%
Usefulness	4.07	69	32.70%



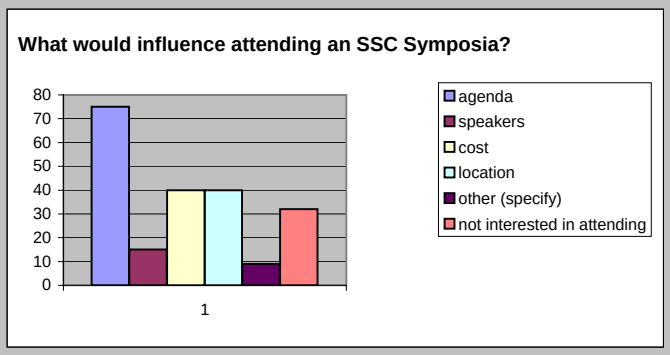
Question 15 **Response** **%**

Yes	48	22.75%
No	163	77.25%



Question 16 **Response** **%**

agenda	75	35.55%
speakers	15	7.11%
cost	40	18.96%
location	40	18.96%
other (specify)	9	4.27%
not interested in attending	32	15.17%



SSC Survey Data Collection Comparison

8-Sep-06
Sample Size 211

Question 1	Response	%
Professional/technical society or organization	77	46.67%
Educational institution or library	22	13.33%
Referral from within your office or academic institution	35	21.21%
Internet Search	57	34.55%
Other	20	12.12%

Question 2	Response	%
weekly or more	22	13.33%
monthly	56	33.94%
quarterly	50	30.30%
annually	20	12.12%
less than annually	8	4.85%
first time	55	33.33%

Question 3	Response	%
source of technical research	131	79.39%
source of funds to conduct research	12	7.27%
source of research topics	11	6.67%
have not used SSC	57	34.55%

Question 4 Choose All Applicable	Response	%
educational case studies	74	44.85%
SSC Research Reports	156	94.55%
Project Recommendations	74	44.85%

24-Aug-06
Sample Size 165

Question 1	Response	%
Professional/technical society or organization	54	32.73%
Educational institution or library	19	11.52%
Referral from within your office or academic institution	27	16.36%
Internet Search	48	29.09%
Other	17	10.30%

Question 2	Response	%
weekly or more	19	11.52%
monthly	47	28.48%
quarterly	33	20.00%
annually	12	7.27%
less than annually	6	3.64%
first time	48	29.09%

Question 3	Response	%
source of technical research	97	58.79%
source of funds to conduct research	10	6.06%
source of research topics	9	5.45%
have not used SSC	49	29.70%

Question 4 Choose All Applicable	Response	%
educational case studies	62	37.58%
SSC Research Reports	107	64.85%
Project Recommendations	52	31.52%

3-Aug-06
Sample Size 95

Question 1	Response	%
Professional/technical society or organization	29	30.53%
Educational institution or library	11	11.58%
Referral from within your office or academic institution	20	21.05%
Internet Search	26	27.37%
Other	9	9.47%

Question 2	Response	%
weekly or more	13	13.68%
monthly	30	31.58%
quarterly	14	14.74%
annually	8	8.42%
less than annually	4	4.21%
first time	26	27.37%

Question 3	Response	%
source of technical research	53	55.79%
source of funds to conduct research	7	7.37%
source of research topics	3	3.16%
have not used SSC	32	33.68%

Question 4 Choose All Applicable	Response	%
educational case studies	36	37.89%
SSC Research Reports	70	73.68%
Project Recommendations	33	34.74%

Current active research projects	80	48.48%
Principal and Liaison member links	18	10.91%
Maritime Links	40	24.24%
What's New/Events	38	23.03%
Not Applicable	41	24.85%

Question 5	Response	%
preventing ship structure failure	158	95.76%
preventing loss of cargo	33	20.00%
improving safety	118	71.52%
improving production techniques	57	34.55%
improving life cycle support	58	35.15%
none	31	18.79%

Question 6 Specific Examples of Value Provided BY SSC		
N/A or Illegible	73	44.24%
Specific examples	138	83.64%

Question 7	Response	%
once per year	18	10.91%
once every few years	32	19.39%
Never submitted	161	97.58%

Question 8	Response	%
accepted and funded request	12	7.27%
non-funded request	17	10.30%
Both	25	15.15%
Never submitted	157	95.15%

Question 9

Response	Average Rating	No Response

Current active research projects	63	38.18%
Principal and Liaison member links	15	9.09%
Maritime Links	30	18.18%
What's New/Events	30	18.18%
Not Applicable	36	21.82%

Question 5	Response	%
preventing ship structure failure	120	72.73%
preventing loss of cargo	25	15.15%
improving safety	88	53.33%
improving production techniques	43	26.06%
improving life cycle support	43	26.06%
none	27	16.36%

Question 6 Specific Examples of Value Provided BY SSC		
First time visitor	65	39.39%
N/A or Illegible	100	60.61%

Question 7	Response	%
once per year	16	9.70%
once every few years	21	12.73%
Never submitted	128	77.58%

Question 8	Response	%
accepted and funded request	9	5.45%
non-funded request	12	7.27%
Both	16	9.70%
Never submitted	128	77.58%

Question 9

Response	Average Rating

Current active research projects	40	42.11%
Principal and Liaison member links	8	8.42%
Maritime Links	14	14.74%
What's New/Events	19	20.00%
Not Applicable	18	18.95%

Question 5	Response	%
preventing ship structure failure	74	77.89%
preventing loss of cargo	17	17.89%
improving safety	48	50.53%
improving production techniques	26	27.37%
improving life cycle support	28	29.47%
none	14	14.74%

Question 6 Specific Examples of Value Provided BY SSC		
First time visitor	4	4.21%
N/A or Illegible	39	41.05%
Specific examples	52	54.74%

Question 7	Response	%
once per year	6	6.32%
once every few years	14	14.74%
Never submitted	75	78.95%

Question 8	Response	%
accepted and funded request	4	4.21%
non-funded request	5	5.26%
Both	11	11.58%
Never submitted	75	78.95%

Question 9

Response	Average Rating

Opportunities to recommend research projects	3.55	93
opportunities to submit a proposal on funded research	3.37	94
posting of recently published research reports on ssc website	3.83	89

Question 10

Response	Average Rating	No Response
Content	4.12	68
Search ability	3.68	69
Usefulness	4.07	69

Question 15	Response	%
Yes	48	29.09%
No	163	98.79%

Question 16	Response	%
agenda	75	45.45%
speakers	15	9.09%
cost	40	24.24%
location	40	24.24%
other (specify)	9	5.45%
not interested in attending	32	19.39%

Opportunities to recommend research projects	3.5	75
opportunities to submit a proposal on funded research	3.32	80
posting of recently published research reports on ssc website	3.79	76

Question 10

Response	Average Rating	
Content	4.15	58
Search ability	3.71	59
Usefulness	4.12	60

Question 15	Response	%
Yes	31	18.79%
No	134	81.21%

Question 16	Response	%
agenda	59	35.76%
speakers	14	8.48%
cost	30	18.18%
location	26	15.76%
other (specify)	8	4.85%
not interested in attending	28	16.97%

Opportunities to recommend research projects	3.54 rating
opportunities to submit a proposal on funded research	3.31 rating
posting of recently published research reports on ssc website	3.84 rating

Question 10

Response	Average Rating
Content	4.2 rating
Search ability	3.75 rating
Usefulness	4.0 rating

Question 15	Response	%
Yes	21	22.11%
No	74	77.89%

Question 16	Response	%
agenda	36	37.89%
speakers	7	7.37%
cost	22	23.16%
location	10	10.53%
other (specify)	4	4.21%
not interested in attending	16	16.84%

Webtrends Hits and User Profil

	Oct-03	Nov-03	Dec-03	Jan-04	Feb-04	Mar-04	Apr-04	May-04
Average hits per day	1594	1620	1112	2234	2038	1554	1443	1201
Number of visits from search engines	1680	1843	1484	1701	1758	1956	1901	1812

	Oct-03	Nov-03	Dec-03	Jan-04	Feb-04	Mar-04	Apr-04	May-04
Commercial	8540	6340	7758	9750	7974	10056	10056	7970
Network	8899	5503	5602	11610	7550	7703	7703	5026
Education	3572	1877	1147	4338	2986	2952	2952	4355
Military	1014	556	343	1121	520	763	763	1854
Organization	992	484	349	1338	596	739	739	776
Government	92	201	253	276	174	113	113	133
International	10	0	0	0	19	383	383	0
Arpanet	39	0.00%	2	0	40	3	3	0
Total	23158	14961	15454	28433	19859	22712	20114	

Total Hits	49437	48623	34483	69255	59107	48194	45214	38437

e Data

Jun-04	Jul-04	Aug-04	Sep-04	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05
1155	1429	1336	1385	1813	1632	1632	2022	2261
1479	1742	1867	2095	2147	2440	2440	2685	2329

Jun-04	Jul-04	Aug-04	Sep-04	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05
7723	7321	6880	14415	9403	9394	9190	10556	9771
5084	5609	4997	6237	10278	9918	9911	11650	8489
1867	1379	4425	1657	3593	4517	4517	3626	2755
1205	618	642	804	855	620	620	1072	650
720	5714	717	729	390	257	257	715	1528
262	297	223	243	220	294	294	192	171
7	2	6	0	6	17	17	0	0
3		197	11	6	2	2	12	14
16871	20940	18087	24096	24751	25019	24808	27823	23378
35832	45748	41443	42952	56228	48965	48965	62685	63321

Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05
2029	1797	1966	1419	1524	1355	1868	1680	1718
3442	2948	2797	2111	2124	2277	2418	2645	2718

Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05
11832	13632	11014	10020	10870	10151	12350	10508	10346
11351	9219	12001	7389	8157	6148	10123	11461	9432
3107	3684	5821	1486	1918	2650	1955	2840	3745
2278	1712	2000	2008	1381	1558	1965	1644	1952
767	1299	1876	450	570	331	469	881	469
226	161	304	311	278	163	138	428	260
3	0	0	0	0	0	0	0	0
35	4	10	15	0	76	4	13	2
29599	29711	33026	21679	23174	21077	27004	27775	26206
62899	55710	62929	44007	48781	43361	57935	52084	51544

Dec-05

2166

2809

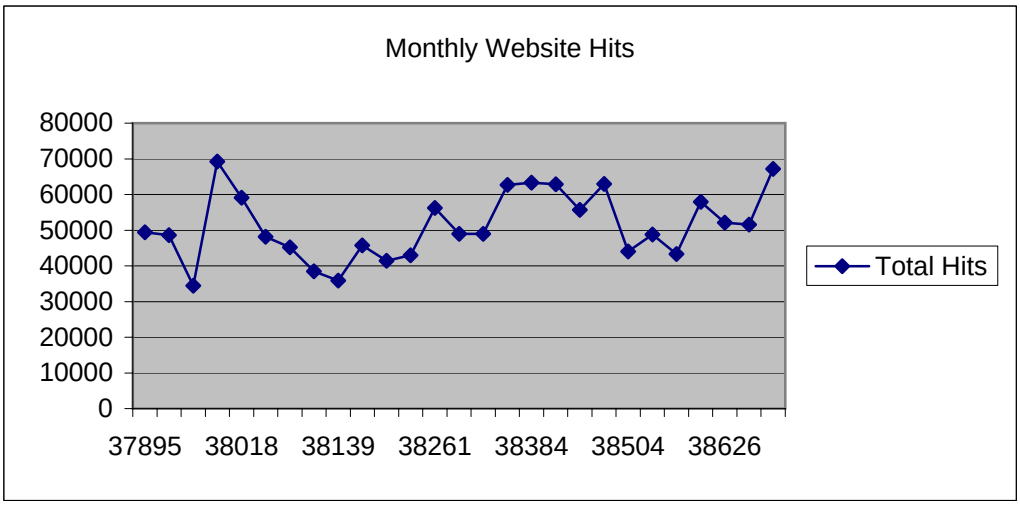
Dec-05

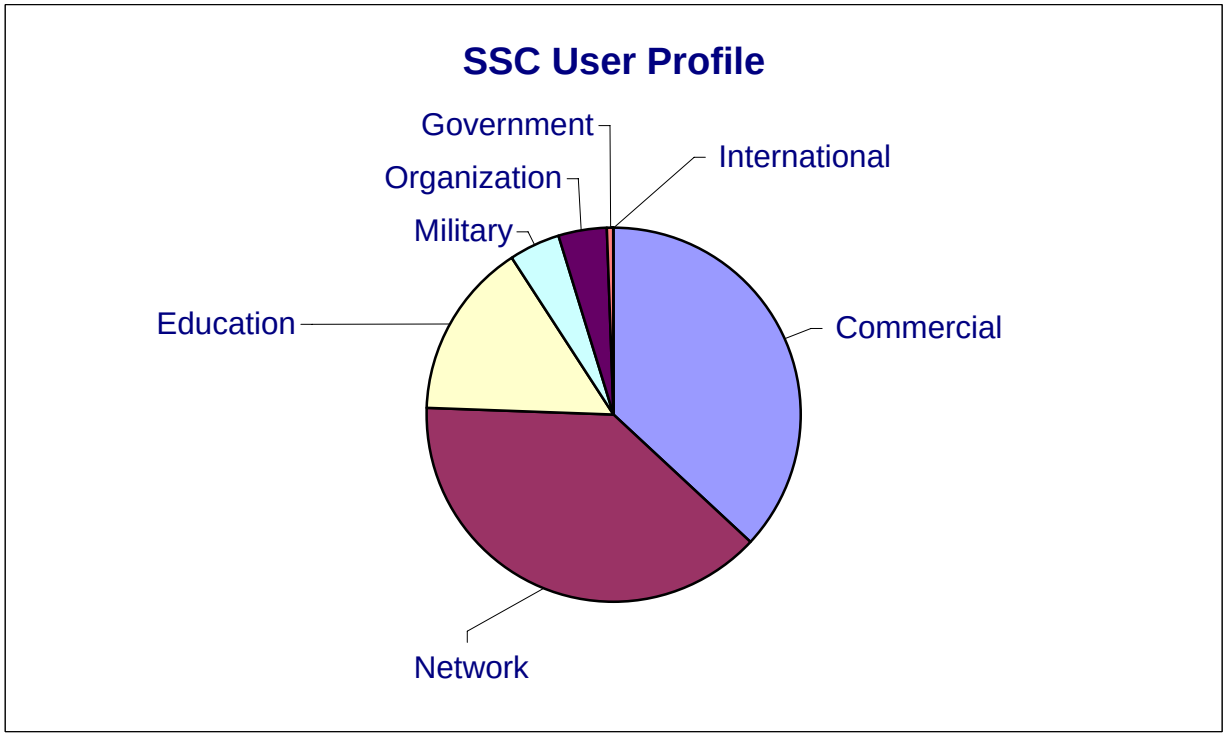
10938
11912
2466
1846
498
245
43
0

27948

67164

Webtrends Hits and User Profile Graphs

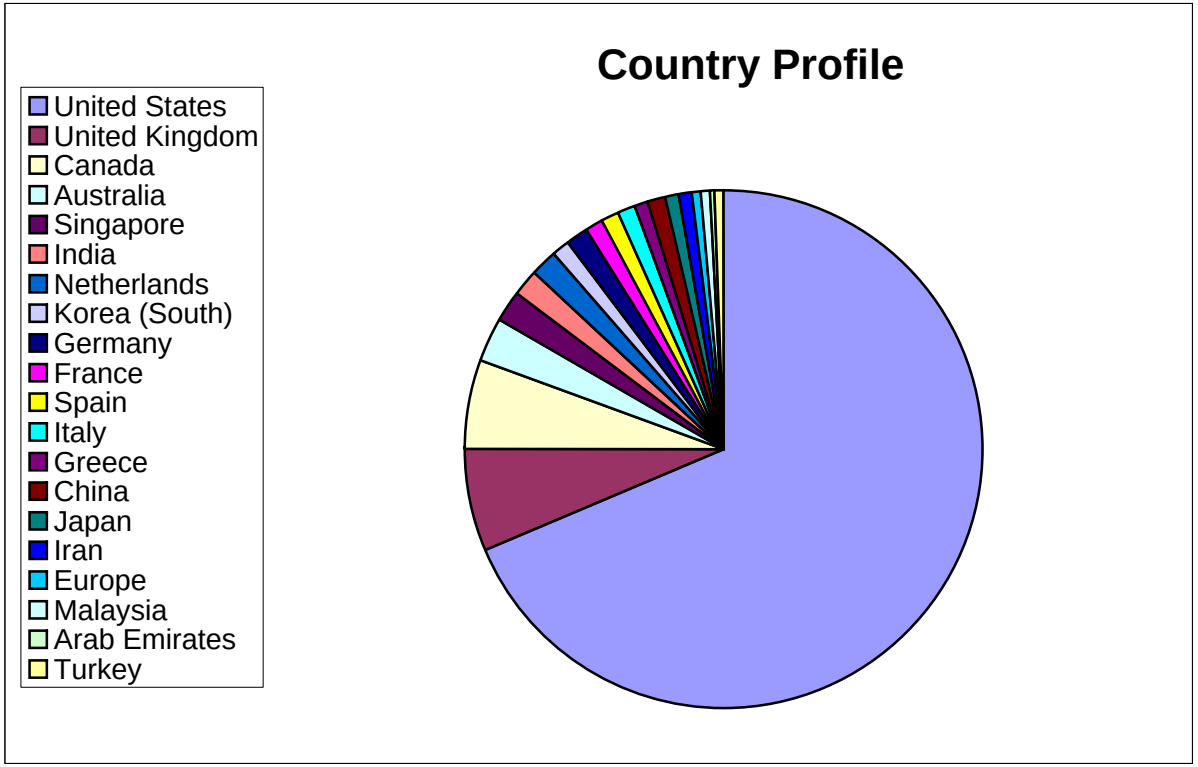


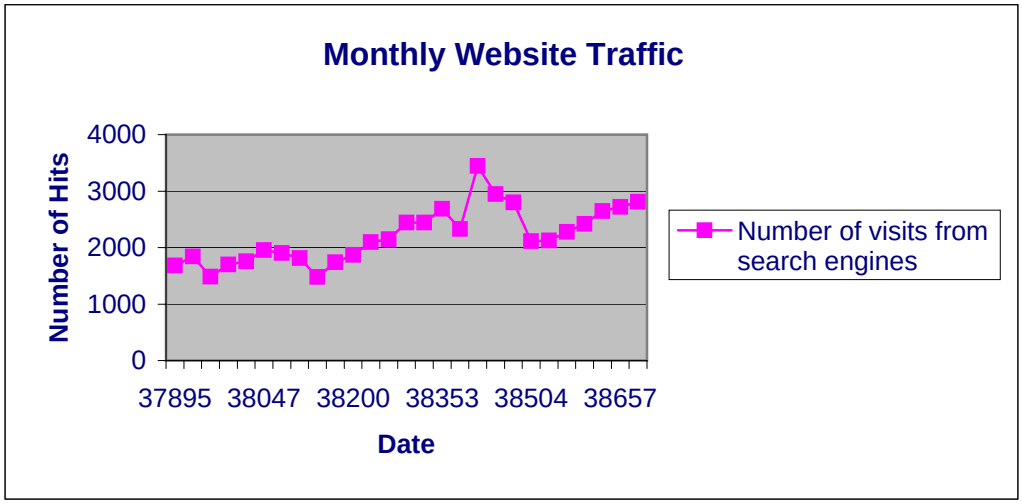


Monthly Visits to SSC Website Per Year

Country Profile

United States	166204
United Kingdom	15843
Canada	13034
Australia	7262
Singapore	4626
India	3936
Netherlands	3792
Korea (South)	3178
Germany	3142
France	2901
Spain	2576
Italy	2487
Greece	2422
China	2328
Japan	2234
Iran	1637
Europe	1400
Malaysia	1243
Arab Emirates	1222
Turkey	1056




Monthly Website Traffic
Number of Hits
4000
3000
2000
1000
0
37895
38047
38200
38353
38504
38657
Date
Number of visits from search engines

PROJECT TECHNICAL COMMITTEE MEMBERS

The following persons were members of the committee that represented the Ship Structure Committee to the Contractor as resident subject matter experts. As such they performed technical review of the initial proposals to select the contractor, advised the contractor in cognizant matters pertaining to the contract of which the agencies were aware, performed technical review of the work in progress and edited the final report.

Chairman

Members
Contracting Officer's Technical Representative:

Marine Board Liaison:

Executive Director Ship Structure Committee:

RECENT SHIP STRUCTURE COMMITTEE PUBLICATIONS

Ship Structure Committee Publications on the Web - All reports from SSC 1 to current are available to be downloaded from the Ship Structure Committee Web Site at URL: http://www.shipstructure.org

SSC 445 – SSC 393 are available on the SSC CD-ROM Library. Visit the National Technical Information Service (NTIS) Web Site for ordering hard copies of all SSC research reports at URL: http://www.ntis.gov

SSC Report Number	Report Bibliography
SSC 449	Hydrodynamic Pressures and Impact Loads for High Speed Catamaran/SES, Vorus. W 2007
SSC 448	Fracture Mechanics Characterization of Aluminum Alloys for Marine Structural Applications, Donald J.K., Blair A. 2007
SSC 447	Fatigue and Fracture Behavior of Fusion and Friction Stir Welded Aluminum Components, Kramer R. 2007
SSC 446	Comparative Study of Naval and Commercial Ship Structure Design Standards, Kendrick, A., Daley C. 2007
SSC 445	Structural Survivability of Modern Liners, Iversen R. 2005
SSC 444	In-Service Non-Destructive Estimation of the Remaining Fatigue Life of Welded Joints, Dexter R.J., Swanson K.M., Shield C.K. 2005
SSC 443	Design Guidelines for Doubler Plate Repairs on Ship Structures Sensharma P.K., Dinovitzer A., Traynham Y. 2005
SSC 442	Labor-Saving Passive Fire Protection Systems For Aluminum And Composite Construction E. Greene, 2005
SSC 441	Fire Degradation, Failure Prediction And Qualification Methods For Fiber Composites R. Asaro, M. Dao, 2005
SSC 440	Deterioration of Structural Integrity Due to Chemical Treatment of Ballast Water S. Tiku, 2005
SSC 439	Comparative Structural Requirements For High Speed Crafts K. Stone, 2005